LESSON STUDY: IMPROVING STUDENT LEARNING THROUGH TEACHER COLLABORATION

Brief Overview:

Step 1: Defining the Problem

Lesson study is, fundamentally, a problem-solving process. The first step, therefore is to define the problem that will motivate and direct the work of the lesson-study group (pair). The problem can start out as a general one (i.e., to awaken students' interests in mathematics) or it can be more specific (i.e., to improve students' understanding of how to add fractions with unlike denominators). The group (pair) will then shape and focus the problem until it can be addressed by a specific classroom lesson.

Usually the problem teachers choose is one they have identified from their own practice, something that has posed particular challenges for their own students. Sometimes, however, the problem is posed from above, perhaps by educational leaders (administrators/coordinators) seeking teachers' input on problems identified as school priorities. At other times, the administration issues recommendations that teachers are expected to implement. This combination of top-down and bottom-up provides a direct connection between classroom teachers and educational leaders.

Step 2: Planning the Lesson

Once a learning goal has been chosen, teachers begin meeting to plan the lesson. Although one teacher will ultimately teach the lesson as part of the process, the lesson itself is seen by all involved as a group (pair) product. The goal is not only to produce an effective lesson but also to understand why and how the lesson works to promote understanding among students. The initial plan that the group (pair) produces should be presented at a department/faculty meeting in order to solicit criticism. Based on such feedback, a revision is produced, ready for implementation.

As an example, mathematics teachers may be engaged in detailed discussions of the following topics in planning a lesson:

- The problem with which the lesson would begin, including such details as the exact wording and numbers to be used.
- The materials students would be given to use in trying to solve the problem.
- The anticipated solutions, thoughts, and responses that students might develop as they struggled with the problem.
- The kinds of questions that could be asked to promote student thinking during the lesson, and the kinds of guidance that could be given to students who showed one or another type of misconception in their thinking.
- How to use the space on the whiteboard (organizing the whiteboard can play a critical part in organizing students' thinking and understanding).
- How to apportion the fixed time of the lesson—about eighty minutes—to different parts of the lesson.
- How to handle individual differences in level of mathematical preparation among the students.

- How to end the lesson—considered a key moment in which students' understanding can be advanced.

Step 3: Teaching the Lesson

A date is set to teach the lesson. One teacher will teach the lesson, but everyone in the group (pair) will participate fully in the preparation. On the day of lesson, the other teacher(s) in the group (pair) leave their classrooms to observe the lesson being taught. (If scheduling release time is a problem, then some schools simply have the teacher(s) leave their classrooms without adult supervision, and two students appointed to serve as class monitors, are left in charge of the class). The teacher(s) stand or sit in the back as the lesson begins, but when students are asked to work at their desks, the teacher-observer(s) walk around, observing and taking careful notes on what students are doing as the lesson progresses. Sometimes the lesson is videotaped as well, for later analysis and discussion.

Step 4: Evaluating the Lesson and Reflecting on Its Effects

The group (pair) generally stays after school to meet on the day the lesson has been taught. Usually, the teacher who taught the lesson is allowed to speak first, outlining in his or her own view how the lesson worked and what the major problems were. Then other members of the group speak, usually critically, about the parts of the lesson they saw as problematic. The focus is on the lesson, not on the teacher who taught the lesson ; the lesson, after all, is a group (pair) product, and all members of the group (pair) feel responsible for the outcome of their plan. They are, in effect, critiquing themselves. This is important, because it shifts the focus from a personal evaluation to a self-improvement activity.

Step 5: Revising the Lesson

Based on their observations and reflections, teachers in the lesson-study group (pair) revise the lesson. They might change the materials, the activities, the problems posed, the questions asked, or all these things. They often will base their changes on specific misunderstandings evidenced by students as the lesson progressed.

Lesson Study is Based on a Long-term Continuous Improvement Model

Lesson study is a process of improvement that is expected to produce small, incremental improvements in teaching over long periods of time. It is emphatically not a reformlike process.

The lesson-study process respects the fact that teaching is a cultural activity. Ronald Gallimore, who has written extensively about these issues, says, "Cultural activities are historically evolved solutions to adaptive challenges. They were constructed over time through collaborative human effort to achieve a stable daily routine. Changes in cultural activity are made slowly, gradually, and are built on existing routines."[1] Because teaching is a cultural activity, it will not change quickly or drastically.

Lesson Study Maintains a Constant Focus on Student Learning

The lesson-study process has an unrelenting focus on student learning. All efforts to improve lessons are evaluated with respect to clearly specified learning goals, and revisions are always justified with respect to student thinking and learning.

Lesson Study Is Collaborative

By working in groups (pairs) to improve instruction, teachers are able to develop a shared language for describing and analyzing classroom teaching, and to teach each other about teaching.

The often-described isolation of CIS high school teachers has greatly hindered our discussions about teaching and hence our ability to improve it. CIS high school teachers rarely have the opportunity to observe other teachers in action and are rarely observed by other teachers or education leaders. For whatever reason, teaching at the CIS high school is considered a private, not a public, activity. The consequences of this isolation are severe. Teachers might agree in discussion, for example, that "problem solving" should be a central focus of the mathematics classroom. But in practice, different teachers might have completely different understandings of what "problem solving" entails. The term is the same, but the referent of the term is private and varies from person to person.

Another important benefit of the collaborative nature of lesson study is that it provides a benchmarking process that teachers can use to gauge their own skills. Collaboration includes continuing interactions about effective teaching methods plus observations of one another's classrooms. These activities help teachers reflect on their own practice and identify things that can be improved.

At the same time, the collaborative nature of lesson study balances the self-critiquing of individual teachers with the idea that improved teaching is a joint process, not the province or responsibility of any individual. When one teacher teaches the lesson and the others observe, problems that emerge are generally attributed to the lesson as designed by the group (pair), not to the teacher who implemented the lesson. It thus becomes possible for teachers to be critical without offending their colleague. The discussion can focus more pointedly and deeply on the merits and deficiencies of the lesson, and on the process of revising and improving it.

Six Principles for Gradual Measurable Improvement

Principle 1: Expect Improvement to Be Continual, Gradual, and Incremental

Because teaching is a system that is deeply embedded in the surrounding culture of schools, any changes will come in small steps, not in dramatic leaps. History supports this claim: In spite of waves of change that have called for sudden, major shifts, teaching has always evolved like other complex, culturally embedded activities—slowly and incrementally.

We must take a long-term view when we design initiatives for improving teaching. We must reset our expectations and anticipate slow and steady improvement, not momentous change. Efforts to change teaching overnight, or even over a few years, are unlikely to have their intended effect. In addition, we must learn to value small improvements. Teachers must be allowed and encouraged to invent small changes in the system of teaching and then to keep track of these changes so they can be accumulated and shared.

Principle 2: Maintain a Constant Focus on Student Learning Goals

The goal of teaching is students' learning. The goal of improving teaching is improving students' learning. Bruce Joyce, has noted: "The centrality of student learning becomes lost as the details of

program implementation become ends in themselves." The question of whether of how these changes are improving students' learning in the teacher's classroom gets lost in the sheer effort to change.

Improving complex systems, such as teaching, requires a relentless focus on the bottom-line goals—in this case, students' learning—and a commitment to evaluate changes with respect to these goals. Such a focus appears to be a necessary component of any successful school improvement program.

Principle 3: Focus on Teaching, Not Teachers

We believe that long-term improvement in teaching will depend more on the development of effective methods for teaching than on the identification and recruitment of talented individuals into the profession. In biological evolution we know that it is the gene that is subject to natural selection, not the individual organism. Individuals are short-lived by evolutionary standards; they don't last long enough to undergo the slow process of evolutionary change. Genes, in contrast, persist over hundreds and thousands of generations. Teaching, similarly, persists, while teachers come and go. If we are to achieve long-term improvements in classroom teaching and learning, we must shift our focus from teachers to teaching.

Teachers follow scripts that they acquire as members of their culture, and their effectiveness depends on the scripts they use. Recruiting highly qualified teachers will not result in steady improvement as long as they continue to use the same scripts. It is the scripts that must be improved.

Principle 4: Make Improvements in Context

Educators have become increasingly aware of the importance of context in understanding and facilitating learning, but the arguments have been applied more often to students' learning than to teachers' learning. Teaching, given its systemic, cultural nature, is especially sensitive to context—a good reason to take advantage of the very contexts in which teachers function every day. Teachers learning in the classrooms and school in which they teach is an idea that has been proposed for some time, yet for the most part we have not realized this opportunity. It certainly contrast with many traditional methods of teacher development (i.e., weekend workshops, university courses) in which teachers are expected to learn something new, disconnected from their context, then hope it works when they take it back to their classrooms.

Principle 5: Make Improvement the Work of Teachers

One way to ensure that improvements can be developed in context is to entrust change to those engaged in the activity—teachers. Improving something as complex and culturally embedded as teaching requires the efforts of all the stakeholders. But teachers must be the primary driving force behind change. They are best positioned to understand the problems that students face and to generate possible solutions. In fact, almost all successful attempts to improve teaching have involved teachers working together to improve students' learning.

Teachers should be engaged in improvement because they are the only ones who can ensure that students' learning improves. They are the gatekeepers of the classrooms in which teaching and learning take place.

Principle 6: Build a System That Can Learn from Its Own Experience

Each day, CIS high school teachers solve problems, try new approaches, and develop their own knowledge of what works and what doesn't work in their own classrooms. Yet we have no way to harvest what even the most talented teachers have learned, no way to share that knowledge and use it to advance the professional knowledge base of teaching. CIS high school teachers work alone, for the most part, and when they leave CIS, all that they have learned is lost. Each new rotation of teachers must start from scratch, finding their own way.

If efforts to improve the CIS high school are going to add up to more than just a temporary fix, it is necessary to find a way to accumulate knowledge about teaching and to share this knowledge with new teachers entering the high school. In the long run, of course, we need to change the teaching scripts that direct classroom practice. Scripts themselves might be the most effective means of storing professional knowledge. But scripts will not be changed unless we have a knowledge base to support the change. We must build a system with a memory, in other words, one that provides a means of accumulating the experiences and insights of teachers. Without this, there is no way of getting better over time.

Meeting Teachers' Needs

Teaching is a difficult and demanding job. Teachers are isolated from their colleagues and rarely have the opportunity to participate in professional life outside the classroom. They are pressed by administrators to take on new responsibilities, to teach a variety of courses, and to produce results. But they are given few resources to meet these demands. Lesson study is not just another activity that teachers must add to the list of expectations, it is a way for teachers to deal with these expectations. Lesson study is a comprehensive program that can provide teachers with opportunities for practice-based professional development.

With its detailed analysis of practice and its frequent observations of other teachers, lesson study provides benchmarks against which teachers can measure their own practice and compare it with that of their colleagues. These comparisons can create in teachers a strong desire to improve their own practice. As teachers watch other teachers, it is possible for them to imagine new possibilities for their own teaching. Lesson study provides a concrete means of trying out these possibilities in a nonthreatening context with the help of colleagues. This personal motivation is, in the end, the kind of demand that will produce improved teaching.

Making It Work

Lesson study is, at its core, a teacher activity. Teachers must make it work. True, it is impossible for teachers to initiate and sustain a vigorous program of lesson study without the active support of the principal and education leaders. But the success of the activity ultimately depends on teachers.

The actual process of lesson study might take a variety of forms, depending on the mission and goal of the school, the learning goals set for students, the teachers' interests, and so on. However, some general guidelines can be suggested to keep the activity focused on the primary goal of improving classroom lessons to increase students' learning.

Time is obviously an essential requirement. For teacher groups (pairs) to make measurable progress in their efforts to improve lessons, they need two hours per week of uninterrupted study. This must be a priority in school scheduling.

Groups (pairs) can be formed on the basis of shared interests, shared problems, common curriculum expectations, or other criteria that make sense for planning common lessons. For example, the school's ninth-grade mathematics teachers might form a group (pair) to design several lessons on introducing ratio and proportion. Or interested teachers of grades 10 and 11 might form a group (pair) to plan a sequence of lessons on global conflicts. All groups should have explicit goals that are consistent with the mission of the school. Schools might announce the study groups (pairs) for the year, perhaps following a planning phase. Teachers might sign up for a group (pair) of their choice or might be asked to serve on a group by the principal.

Conclusion

Through the gradual improvement of individual lessons, and through the knowledge developed and shared during this process, the CIS high school would enable the steady improvement of teachers and teaching, and ultimately provide students with the best possible education.

Stigler, James W., and James Hiebert. *The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom*. New York: Free, 2009. Print.